

NAME		TEACHER				
My GCSE Target Grade is		End of Cycle Teacher Assessment Please circle				
		SAE	AE	E	BE	SBE
End of unit assessment type		Your end of topic assessment will be a written exam.				

YEAR 9F (PI)	CYCLE 1: NUMBER & FRACTIONS
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	Knowledge	Prior knowledge	End of topic
Number	BIDMAS – I can use the order of operations including with positive and negative numbers		
	Ordering Numbers – I can order numbers, including with negatives and decimals		
	Decimal Numbers – I can round to a given number of decimal places and multiply and divide decimal numbers		
	Prime Numbers – I am familiar and can list the prime number sequence		
	Place Value – I can round to a given number of significant figures		
	Estimation – I can use rounding to estimate answers to calculations (and applied to problem solving questions)		
	Squares & Cubes – I can find the square root and cube root and estimate the square root of numbers up to 200		
	Surds & Powers – I can recognise surd notation on a calculator and powers of 2, 3 and 4		
	Factors & Multiples – I can find the factors and multiples of numbers up to 100		
	HCF & LCM – I can find the highest common factor and lowest common multiple of two numbers by listing and apply to problems involving time		
	Prime Factors – I can write a number as a product of its prime factors		
	Venn Diagrams – I can use a Venn diagram to find the LCM and HCF of 2/3 numbers		
Fractions	Equivalent Fractions – I can identify equivalent fractions and compare / order fractions		
	Fractions – I can simplify fractions by finding the HCF of the numerator and denominator		
	Fractions Calculations – I can add and subtract fractions and use them to solve problems		
	Fraction of an amount – I can find a fraction of a quantity or a measurement		

LEARNING TOOLS			
KEY CONCEPTS	Prime Factors	A prime number that is also a factor	
	Surd	Another name for the square root	
KEY WORDS	Estimate	Numerator / Denominator	What is a prime number?
KEY EQUATION		Brackets Indices Division Multiplication Addition Subtraction	
PRE-LEARNING		Y9 Foundation Cycle 1 HegartyMaths Videos: <ul style="list-style-type: none"> • 24 (Order of operations) • 28 (Prime Numbers) 	<ul style="list-style-type: none"> • 31 (Highest Common Factor) • 34 (Lowest Common Multiple) • 59 (Generate Equivalent Fractions)
CAREERS		<ul style="list-style-type: none"> • Computer science: Programmers can use Venn diagrams to visualize computer languages and hierarchies. • Engineering: This looks at how variables in physical systems vary in proportion to each other. Therefore, engineers are full of fractions. Every engineering field uses fractions, from stress-to-strain ratios to chemical concentration ratios and reaction rates. 	

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YEAR 9F (PI)		CYCLE 2: ALGEBRA				
	Knowledge				Prior knowledge	End of topic
Expressions	Expressions – I can use algebraic notation and understand the properties of a term, expression, equation and identity					
	Collecting Like Terms – I can collect like terms to simplify algebraic expression including terms with powers					
	Index Laws – I can use the multiplication and division rules to simplify terms with powers					
	Expressions 2 – I can multiply and divide expressions to simplify and solve problems					
Substitution	Substitution – I can substitute positive and negative numbers into expression (including expressions with powers)					
	Formulae – I can substitute numbers into formulae and apply to real life problems					
	Speed Distance Time – I can apply substitution and use the Speed, Distance & Time triangle to solve problems in context					
Expanding & Factorising	Expanding Brackets – I can expand single brackets and apply to shape problems to form expressions					
	Expanding Double Brackets – I can expand double brackets involving positive numbers using a grid					
	Factorising – I can recognise factors of algebraic terms and identify the highest common factor					
	Factorising Single Brackets – I can write an expression fully factorised including with terms with powers					
LEARNING TOOLS						
KEY CONCEPTS	Expression	An algebraic statement involving a collection of numbers / letters and terms				
	Factorise	A process which involves finding the factors of an expression				
KEY QUESTIONS	What is the difference between an expression and an equation?			What is speed? What units of measure do we use?		
KEY EQUATION	SPEED = DISTANCE / TIME			TIME = DISTANCE =		
PRE-LEARNING	Y9 Foundation Cycle 2 HegartyMaths Videos:		<ul style="list-style-type: none"> • 189 (Substituting & Solving) • 151 (Writing Algebraic Expressions) • 161 (Expand Two Single Brackets & Simplify) • 102 (Index form I: Intro) 			
CAREERS	<p>Computer and Information Research Scientist: These workers design various innovative applications for new and existing technologies. Computational scientists often use algorithms to improve efficiency and create faster computing speeds. They clean up data to a useful form, which can then be used to carry out an effective analysis with equations.</p> <p>Medical scientists: They are responsible for carrying out studies on human diseases and the methods that can prevent or cure them. Assessing results during clinical trials can be achieved by linear algebra and data analysis. Medical scientists are devoted to improving overall human health. To become one, good algebra skills are important.</p>					

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YEAR 9F (PI)	CYCLE 3: GRAPHS / SEQUENCES
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	Knowledge	Prior knowledge	End of topic
Data	Frequency Tables – I can design tables and data collection sheets and read data from tables		
	Two Way Tables – I can design and use a two way table and solve problems		
	Time Series Graphs – I can plot and interpret time series graphs and comment on trends		
Charts / Graphs	Bar Charts – I can draw and interpret comparative and composite bar charts		
	Stem & Leaf Diagrams – I can construct and interpret stem and leaf diagrams including back-to-back stem and leaf diagrams		
	Pie Charts – I can draw and interpret pie charts		
	Scatter Graphs – I can plot and interpret scatter graphs and determine if there is a relationship between sets of data (using correlation)		
	Line of Best Fit – I can draw a line of best fit on a scatter graph and use this to estimate values		
Sequences	Sequences – I can recognise and extend linear sequences		
	Special Sequences – I can recognise and extend special number sequences such as square, cube, prime, Fibonacci, triangular		
	Nth Term – I can use the nth term to generate terms of a sequence		
	Nth Term – I can find the nth term of a linear sequence and determine if a number lies in the sequence		

LEARNING TOOLS		
KEY CONCEPTS	Nth Term	The rule given to the terms in a sequence
	Presenting Data	Why do we present data using a variety of mathematical charts and diagrams?
KEY QUESTIONS	What is Correlation?	Can you think of any popular number sequences?
KEY EQUATION	1, 1, 2, 3, 5, 8... what comes next?	
PRE-LEARNING	Y9 Foundation Cycle 3 HegartyMaths Videos: <ul style="list-style-type: none"> 402 (Grouped Frequency Table: Discrete) 425 (Bar charts & vertical line graphs) 427 (Pie Charts I) 196 (Linear Sequences from Pictures) 197 (Linear Sequences: Term-to-Term rule) 	
CAREERS	Pie charts are often used in business . Examples include showing percentages of types of customers, percentage of revenue from different products, and profits from different countries. Pie charts can be helpful for showing the relationship of parts to the whole when there are a small number of levels. Health Care Professional: The health care field often uses linear equations to calculate medical doses. Linear equations are also used to determine how different medications may interact with each other and how to determine correct dosage amounts to prevent overdose with patients using multiple medications. Doctors also use linear equations to calculate doses based on a patient's weight.	

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YEAR 9F (PI)	CYCLE 4: ALGEBRA / FDP
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	Knowledge	Prior knowledge	End of topic
Solving Equations	Equations 1 – I can use the inverse operation and rearrange simple linear equations		
	Equations 2 – I can solve linear equations involving one and two steps and apply to problems involving angle sums		
	Equations 3 – I can solve linear equations involving brackets and apply to problems involving the area of a shape		
	Equations 4 – I can solve equations with unknowns on both sides of the equation and apply to problems involving the perimeter of a shape		
Inequalities	Inequalities – I can use the correct notation to show greater than, less than and equal to		
	Inequalities 2 – I can identify whole numbers which satisfy an inequality and represent inequalities on a number line		
	Solving Inequalities – I can solve linear inequalities and represent my solutions on a number line		
	Two-sided Inequalities – I can solve two sided inequalities		
FDP	Fractions 1 – I can multiply whole numbers, fractions and mixed numbers		
	Fractions 2 – I can divide a fraction by a whole number and another fraction		
	Fractions / Decimals / Percentages – I can convert fractions to decimals and percentages and vice versa		
	Percentages – I can find 10%, 50%, 120%, 5% and 1% of a quantity		
	Simple Interest – I can calculate simple interest and use percentages to solve problems		

LEARNING TOOLS					
KEY CONCEPTS	Percent	Percent is the same as 'per 100' or out of 100			
KEY QUESTIONS	Greater Than	Less Than	Equal To	Where do you see the word 'Interest' in real life?	
KEY EQUATION	(Amount x Multiplier) ^{number of years}				
PRE-LEARNING	Y9 Foundation Cycle 4 HegartyMaths Videos: <ul style="list-style-type: none"> • 178 (Solve 1-step equations: balance method) • 265 (Representing inequalities on a number line) 		<ul style="list-style-type: none"> • 67 (Multiply whole number by fractions) • 81 (Percentages as pictures) • 93 (Simple Interest) 		
CAREERS	Auditors, budget analysts, and accountants often set budgets and balance accounts with the use of equations. Apart from making family budgets, a financial planner might decide to use financial statements and other financial instruments to make financial decisions. Car Dealer: With car loans, you often pay monthly. This translates to a portion of the payment covering the loan balance on a monthly basis, while the rest is directed toward covering the interest payment. By reducing the outstanding loan balance every month, you reduce the payable interest, meaning, a greater portion of the monthly payment is directed toward principal repayment.				

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YEAR 9F (PI)	CYCLE 5: ANGLES
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	Knowledge	Prior knowledge	End of topic
Angles	Symmetry – I can identify lines of symmetry and rotational symmetry in 2D shapes		
	Congruent Shapes – I can recognise when two shapes are congruent and identify properties		
	Drawing & Measuring Angles – I can draw and measure angles accurately using a protractor and estimate / label different angles		
	Angle Facts – I know and can use angle facts to find missing angles (vertically opposite, angles on a straight line, supplementary)		
	Angles in Triangles – I can solve angle problems in triangles and give reasons for my calculations		
	Angles in Polygons 1 – I can derive the formula for the sum of the interior angles of any regular polygon		
	Angles in Polygons 2 – I can calculate the interior and exterior angles of regular polygons		
	Angles in Parallel Lines - I can understand and use the angles properties in parallel lines and find missing angles using corresponding, alternate and supplementary angle rules		
	Angles & Algebra – I can solve angle problems by forming and solving equations		
Number Skills	Long Multiplication – I can multiply any two numbers together using a multiplication method		
	Long Division – I can use long division to divide any two numbers		
	Problem Solving – I can use long multiplication and division to solve problems involving money, measurements and compound measures (SDT / DMV)		

LEARNING TOOLS		
KEY CONCEPTS	Congruent	Congruent shapes are identical
	Parallel	Corresponding and Alternate angles are _____
KEY QUESTIONS		What is the difference between congruence and similarity?
KEY EQUATION		$(n-2) \times 180$ $360/n$ where n is the number of sides
PRE-LEARNING	Y9 Foundation Cycle 5 HegartyMaths Videos:	
	<ul style="list-style-type: none"> • 477 • 480 • 812 	
CAREERS	<ul style="list-style-type: none"> • Cartographer: designs maps using computerized mapping software and Geographical Information Systems (GIS). They need to research, gather and evaluate data to input into maps, checking accuracies of various maps and evaluating satellite images and aerial photos to create accurate and detailed maps. • Accountant: prepare and examine accounting records, financial statements or financial reports to assess accuracy and conformity to accounting standards. Accountants spend most of the day working with numbers, so accuracy is a huge deal. Skill in math is important for computing taxes, fixing or managing budgets, and keeping the financial records straight. 	

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YEAR 9F (PI)	CYCLE 6: AVERAGES / SHAPE
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	Knowledge	Prior knowledge	End of topic
Perimeter / Area / Volume	2D Shapes – I can calculate the perimeter and area of rectangles, parallelograms and triangles		
	Missing Lengths – I can calculate a missing length on a shape given the area		
	Trapezia – I can calculate the area and perimeter of trapezia and find the height of a trapezium given its area		
	Compound Shapes – I can calculate the perimeter and area of shapes made from triangles and rectangles		
	Metric Measures – I can convert between metric measures of area and understand the link between cm squared and metres squared		
	Nets – I can draw the nets of a cuboid and triangular prism with accurate dimensions		
	Surface Area of 3D Shapes – I can calculate the surface area of a cuboid and a triangular prism		
	Volume of a Prism – I can calculate the volume of a cuboid and a prism and decide whether a 3D solid is a prism		
	Problem Solving - I can solve problems involving surface area and volume and convert between measures of volume		
Averages	Mean & Range – I can calculate the mean of a set of a data from a list and a frequency table and compare sets of data using the mean and range		
	Stem & Leaf Diagrams – I can find the mode, median and range from a stem and leaf diagram and identify any outliers		
	Grouped Frequency Tables – I can estimate the range and mean from a grouped frequency table and find the modal class		
	Sampling – I understand the need for sampling and how to avoid bias		

LEARNING TOOLS		
KEY CONCEPTS	Compound Shape	A shape made up of two or more shapes is known as a compound shape – can you think of any real life examples?
	Mean =	Sum of data / Amount of data
KEY QUESTIONS	3D Shapes	What is the difference between surface area and volume?
KEY EQUATION		$1000\text{cm}^3 \approx 1 \text{ litre}$
PRE-LEARNING		Y9 Foundation Cycle 6 HegartyMaths Videos: <ul style="list-style-type: none"> • 548 • 567 • 405
CAREERS		<ul style="list-style-type: none"> • Dentist: A dentist uses surface area to determine the size of dental restorations, such as bridges and dental implants. To make sure their patients maintain the same chewing capabilities they had with their original teeth, dentists follow Ante's Law, which states that the surface area of the replacement must be equal to or greater than the surface area of the original tooth. • Painter: Professional painters use surface area to determine how much paint they will need for a project. They calculate the surface area of a wall by multiplying the width of the room by its height from floor to ceiling, subtracting the total areas of any windows or doors that they aren't planning to paint. They then divide the total surface area to paint by the coverage of each paint can, to determine the number of cans to purchase.